

M*5283 thru M*5314 and C†5283 thru C†5314

HIGH RELIABILITY CURRENT REGULATOR DIODES

Features

(*) • Available as screened equivalents using prefixes noted below:

- MX as JTX equivalent
- MV as JTXV equivalent
- MS as JANS equivalent

(†) • Available in chip form using prefixes noted below:

- CH as Aluminum on top, gold on back
- CNS as Titanium Nickel Silver on top and bottom

- Provides essentially constant current over a wide voltage range.
- High Source Impedance

Maximum Ratings

Operating Temperature: -55° C to +175° C

Storage Temperature: -55° C to +175° C

DC Power Dissipation: 475 mW @ $T_L \leq 75^\circ\text{C}$

Power Derating: 3.1 mW/° C @ $T_L > 75^\circ\text{C}$

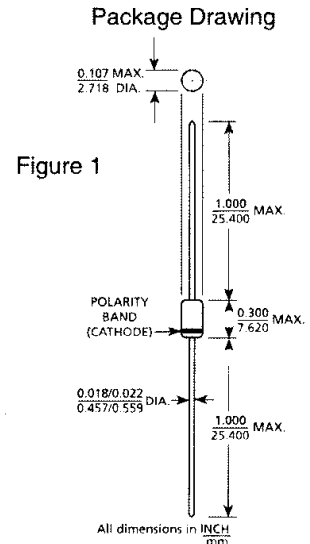
Peak Operating Voltage: 100 Volts

Electrical Characteristics @ 25° C unless otherwise specified.

| TYPE NUMBER | REGULATOR CURRENT I_p (mA) @ $V_S = 25V$ | | | MINIMUM DYNAMIC IMPEDANCE @ $V_S = 25V$ Z_S (M Ω) (Note 1) | MINIMUM KNEE IMPEDANCE @ $V_K = 6.0V$ Z_K (M Ω) (Note 2) | MAXIMUM LIMITING VOLTAGE @ $I_L = 0.8 I_p$ (min) V_L (VOLTS) |
|-------------|---|-------|-------|---|---|--|
| | NOM | MIN | MAX | | | |
| 1N5283 | 0.22 | 0.198 | 0.242 | 25.0 | 2.75 | 1.00 |
| 1N5284 | 0.24 | 0.216 | 0.264 | 19.0 | 2.35 | 1.00 |
| 1N5285 | 0.27 | 0.243 | 0.297 | 14.0 | 1.95 | 1.00 |
| 1N5286 | 0.30 | 0.270 | 0.330 | 9.0 | 1.60 | 1.00 |
| 1N5287 | 0.33 | 0.297 | 0.363 | 6.6 | 1.35 | 1.00 |
| 1N5288 | 0.39 | 0.351 | 0.429 | 4.10 | 1.00 | 1.05 |
| 1N5289 | 0.43 | 0.387 | 0.473 | 3.30 | 0.870 | 1.05 |
| 1N5290 | 0.47 | 0.423 | 0.517 | 2.70 | 0.750 | 1.05 |
| 1N5291 | 0.56 | 0.504 | 0.616 | 1.90 | 0.560 | 1.10 |
| 1N5292 | 0.62 | 0.558 | 0.682 | 1.55 | 0.470 | 1.13 |
| 1N5293 | 0.68 | 0.612 | 0.748 | 1.35 | 0.400 | 1.15 |
| 1N5294 | 0.75 | 0.675 | 0.825 | 1.15 | 0.335 | 1.20 |
| 1N5295 | 0.82 | 0.738 | 0.902 | 1.00 | 0.290 | 1.25 |
| 1N5296 | 0.91 | 0.819 | 1.001 | 0.880 | 0.240 | 1.29 |
| 1N5297 | 1.00 | 0.900 | 1.100 | 0.800 | 0.205 | 1.35 |
| 1N5298 | 1.10 | 0.990 | 1.210 | 0.700 | 0.180 | 1.40 |
| 1N5299 | 1.20 | 1.06 | 1.32 | 0.640 | 0.155 | 1.45 |
| 1N5300 | 1.30 | 1.17 | 1.43 | 0.580 | 0.135 | 1.50 |
| 1N5301 | 1.40 | 1.26 | 1.54 | 0.540 | 0.115 | 1.55 |
| 1N5302 | 1.50 | 1.35 | 1.65 | 0.510 | 0.105 | 1.60 |
| 1N5303 | 1.60 | 1.44 | 1.76 | 0.475 | 0.092 | 1.65 |
| 1N5304 | 1.80 | 1.62 | 1.98 | 0.420 | 0.074 | 1.75 |
| 1N5305 | 2.00 | 1.80 | 2.20 | 0.395 | 0.061 | 1.85 |
| 1N5306 | 2.20 | 1.98 | 2.42 | 0.370 | 0.052 | 1.95 |
| 1N5307 | 2.40 | 2.16 | 2.64 | 0.345 | 0.044 | 2.00 |
| 1N5308 | 2.70 | 2.43 | 2.97 | 0.320 | 0.035 | 2.15 |
| 1N5309 | 3.00 | 2.70 | 3.30 | 0.300 | 0.029 | 2.25 |
| 1N5310 | 3.30 | 2.97 | 3.63 | 0.280 | 0.024 | 2.35 |
| 1N5311 | 3.60 | 3.24 | 3.96 | 0.265 | 0.020 | 2.50 |
| 1N5312 | 3.90 | 3.51 | 4.29 | 0.255 | 0.017 | 2.60 |
| 1N5313 | 4.30 | 3.87 | 4.73 | 0.245 | 0.014 | 2.75 |
| 1N5314 | 4.70 | 4.23 | 5.17 | 0.235 | 0.012 | 2.90 |

NOTE 1: Z_S is derived by superimposing a 90Hz rms signal equal to 10% of V_S on V_S .

NOTE 2: Z_K is derived by superimposing a 90Hz rms signal equal to 10% of V_K on V_K .



Mechanical Characteristics

CASE: Hermetically sealed glass case. DO-7 outline.

LEAD MATERIAL: Dumet.

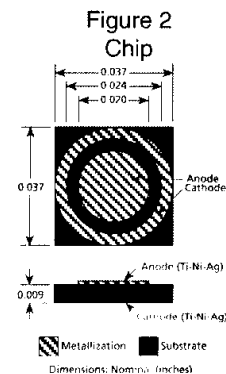
LEAD FINISH: Tin plate.

THERMAL RESISTANCE: 300° C/W (Typical) junction to ambient.

POLARITY: Cathode end is banded.

WEIGHT: 0.2 grams

MOUNTING POSITION: Any.



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FIGURE 3
Typical Current Regulator Characteristics

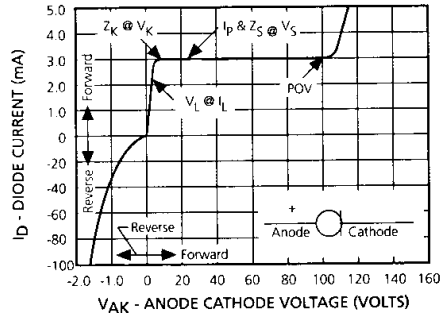


FIGURE 4 Typical Forward Characteristics

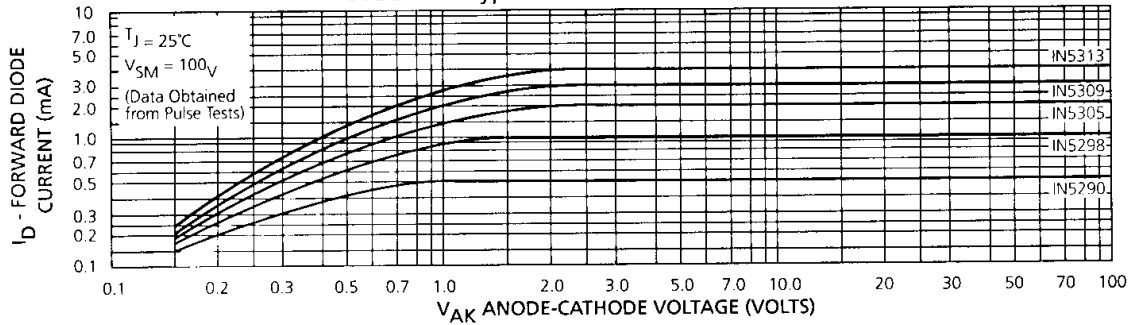


FIGURE 5 Temperature Coefficient

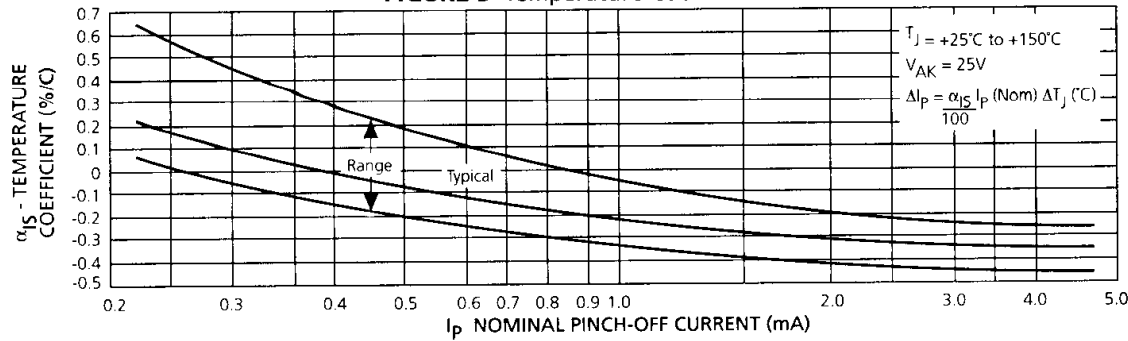
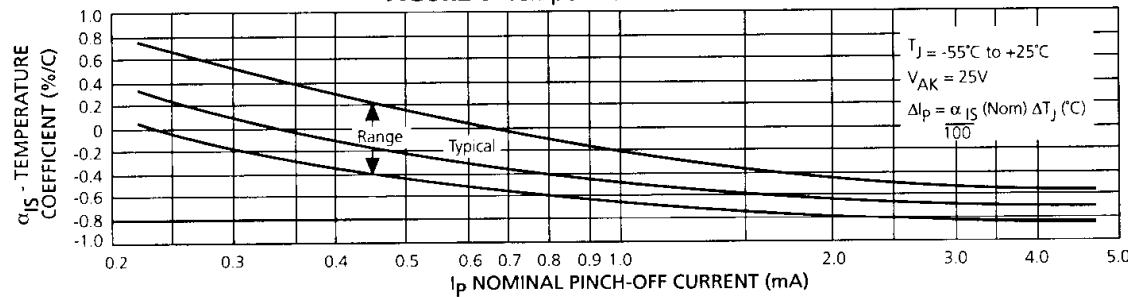


FIGURE 6 Temperature Coefficient



SYMBOLS AND DEFINITIONS

- I_D - Diode Current
- I_p - Pinch-off Current: Regulator current at specified Test Voltage, V_S . I_p is sometimes also identified as I_S .
- POV - Peak Operating Voltage: Maximum voltage to be applied to device.
- α_{I_S} - Current Temperature Coefficient.
- V_K - Knee Impedance Test Voltage: Specified voltage used to establish Knee Impedance, Z_K .
- V_L - Limiting voltage: Measured at I_L , V_L , together with Knee ac Impedance, Z_K , indicates the Knee characteristics of the device.
- V_S - Test Voltage: Voltage at which I_p and Z_S are specified.
- Z_K - Knee AC Impedance at Test Voltage: To test for Z_K , a 90 Hz signal v_K with rms value equal to 10% of test voltage V_K is superimposed on V_K : $Z_K = v_K / i_K$ where i_K is the resultant ac current due to v_K . To provide the most constant current from the diode, Z_K should be as high as possible; therefore, a minimum value of Z_K is specified.
- Z_S - AC Impedance at Test Voltage: Specified as a minimum value. To test for Z_S , a 90 Hz signal v_S with rms value equal to 10% of test voltage, V_S , is superimposed on V_S : $Z_S = v_S / i_S$ where i_S is the resultant ac current due to v_S .